

REMARKS

Claims 1-8 are pending the instant application. In the most recent Office Action, claims 1-8 are rejected under 35 U.S.C. § 101 as allegedly drawn to non-statutory subject matter. Claims 1-8 are rejected under 35 U.S.C. § 103(a) as allegedly obvious over U.S. Patent No. 6,122,572 to Yavani (hereinafter, "Yavani"), in view of "An Architecture for Modeling Uninhabited Aerial Vehicles", IEEE 0-7803-5731-0/99, by Ruff, et al. (hereinafter, "Draper" for consistency with the Office Action nomenclature). Moreover, the specification is objected to for improper inclusion of an external URL.

By the above amendments, the URL at paragraph [0018] of the original specification is stricken. In its place, reference is made to the hard copy of the article made of record by IDS concurrently with the filing of the instant application. Therefore, no new matter has been added by the amendment. Favorable reconsideration and withdrawal of the objection is kindly requested. Moreover, paragraph [0011] is amended to include the serial number of the concurrently filed patent application referenced therein. Claims 4 and 5 are amended above to correct a minor editorial oversight in spelling. No alteration of claim scope is achieved or intended, and the amendment is merely tangential to the substantive issues in this application.

Applicant respectfully traverses all rejections, for at least the following reasons.

The Office Action alleges that the claims recite a mental process augmented by pencil and paper, and further that the claims comprise solely manipulation of abstract ideas by mental process without practical application. The Office Action

relies upon the decision of the CCPA in *In re Prater*, as summarized in the MPEP, to support its position (Bold and underlined emphasis not present in MPEP). Applicants respectfully disagree. In the first instance, a careful reading of the *Prater* decision reveals that the Court expressly declined to rule on the applicability of 35 U.S.C. § 101, but rather affirmed the rejection under § 112. See, *In re Prater*, 415 F.2d 1393, 162 USPQ 541, 551 (CCPA 1969). Therefore, the holding of *Prater* is wholly inapplicable to the present claims, rejected under § 101, not § 112. Moreover, the cited portion of the M.P.E.P. § 2111 itself does not even purport to apply *Prater* in support of a rejection under § 101. Rather, it presents the decision as standing for the proposition that the claims are to be given their broadest reasonable interpretation during prosecution, a proposition of law not in dispute.

Applicant turns then to assertion that the claims comprise solely the manipulation of abstract ideas without practical application. Independent claim 1 recites:

1. (Original) A method of optimizing a command sequence for a UAV to accomplish mission objectives, comprising the steps of:
 - (a) simulating the performance of an initial command sequence by a UAV in a simulated environment, resulting in a simulated mission outcome;
 - (b) modifying the command sequence of said mission;
 - (c) simulating the performance of said modified command sequence by a UAV in said simulated environment, resulting in another simulated mission outcome;
 - (d) iteratively performing steps (b) and (c) to optimize the simulated mission outcome;
 - (e) selecting the one or more command sequences based in part upon which command sequences produce an optimal simulated mission outcome; and
 - (f) encoding each selected command sequence into an algorithmic active packet.

The steps of simulating the performance of an initial or modified command sequence by a UAV in a simulated environment would require the manipulation of at least that portion of a UAV, i.e., a machine, necessary to effect the claimed output of a simulated outcome. Turning to independent claim 8, this claim recites:

8. A method of tracking an autonomous UAV during the performance of a pre-programmed active mission, comprising the steps of:

- (a) simulating the performance of the active mission programmed into the UAV in a current simulation of the environment the UAV is operating in; and
- (b) estimating the present position of the UAV based upon the results of the simulation.

In a similar manner as claim 1, claim 8 recites simulating the active mission pre-programmed in the UAV in a current simulation of the operating environment of the UAV. Both elements of step (a) require the manipulation of at least that portion of a UAV, i.e., a machine, necessary to effect the claimed output results of the simulation. Therefore, the claims as recited go well beyond the mere manipulation of abstract ideas and are in fact, machine or computer-based methods.

Moreover, the practical application of the claimed method steps would be clear to one of ordinary skill in the art upon reading the original specification. Initially, Applicant respectfully disagrees with the Office Action's assertion that optimizing a command sequence to improve UAV performance, or tracking an autonomous UAV during the performance of a pre-programmed mission are not practical applications *per se*. However, the specification details that a UAV programmed with an optimized

command sequence according to present invention is able to carry out mission objectives and is simultaneously less vulnerable to detection while receiving a communicated mission while in flight (see, para. [0026]). Similarly, the claimed method of tracking obviates the need for the UAV to transmit status messages which may compromise its safety (see, para. [0027]). The foregoing are two examples of the many practical applications of the claimed methods.

Therefore, Applicant respectfully submits that claims 1-8 define statutory subject matter under 35 U.S.C. § 101, and that the rejection is poorly taken. Favorable reconsideration and withdrawal is kindly requested.

Turning to the rejections of the claims over the cited references, Applicant respectfully traverses the rejections for at least the following reasons.

Independent claim 1 recites a method of optimizing a command sequence for a UAV to accomplish mission objectives, comprising the steps of, *inter alia*, encoding one or more selected command sequences into an algorithmic active packet. The Office Action admits, as it must, that this feature is neither taught nor suggested by Yavnai. The Office Action supplies Draper, alleging that it ameliorates this deficiency of Yavnai with respect to claim 1. In particular, the Office action states, parenthetically, "obviously, the communication includes 'active' packets" (p. 6). Applicant respectfully disagrees.

In stating that "obviously, the communication includes 'active' packets", the Office Action implicitly acknowledges that the 'active packets' are neither taught nor suggested explicitly in Draper. Rather, the Office Action appears to rely on a theory of inherency to allege that this feature recited in the claims is present in Draper. However,

to support a *prima facie* case of inherency, the limitation in question must “necessarily” be present in the prior art reference. *In re Robertson*, 169 F.3d 743, 49 USPQ2d 1949 (Fed. Cir. 1999). “In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic *necessarily* flows from the teachings of the applied prior art.” *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original).

In this case, no such factual basis has been or even can be provided. The specification describes, as exemplary only, an active packet as an algorithmic representation of a command instruction, for example the command to fly through given waypoints as a curve that fits those points. The algorithmic portion of the active packet is supplemented by a data portion, which could not be represented algorithmically, such as the command to take a photograph at a given point. Turning then to Draper, nothing resembling an active packet is expressly described or even 'obviously' present. Communication does not inherently or necessarily include communicating an active packet of executable code. Communication is most commonly merely static data information, even if that information has been compressed in some way, such as by prior art compression techniques. There is nothing in Draper to indicate that the communication described therein comprises algorithmic representations or executable code, such as in an active packet.

Additionally, Applicant specifically and categorically denies the Office Action's assertion that any portion of the specification is an admission of claimed subject matter as prior art. The Office Action alleges that "Applicants have admitted that the

compression aspect of the active packet uses any well known data algorithm, citing p. 11, para. [0024] of the specification. This is incorrect. The specification therein states "At a most basic level, the command sequence may be compressed according to any well-known data compression algorithm. However, specific knowledge of the data to be compressed allows a more efficient hypothesis to be developed." The following paragraph goes on to describe such improved methods, as in the present invention. So it will be seen that the specification does not in any way admitting the compression of the present invention as prior art. Contrary, the specification distinguishes the present invention over such prior art known compression techniques. Therefore, because of the misplaced reliance on such alleged admissions, the rejection is further insufficient to reach at least claim 1.

The Office Action further relies on the alleged admission as applied to claims 4-5 and 7. Claim 4, and claim 5 by dependence on claim 4, recites that a criteria for an optimal mission outcome include the compressibility of the command sequence. Assuming, *arguendo*, that the statements relied upon in the Office Action were any admission, they do not address the selection criterion for an optimal mission. This feature is notably absent from the applied references. Further claim 7 recites that the MDL theorem is the measure of optimal compression of the recited command sequence. Even given that the MDL theorem was known (See para. [0022]) does not admit as prior art to use the MDL theorem as a measure of optimal compressibility of an encoded UAV command sequence. Therefore, because of the misplaced reliance upon such alleged admissions, the rejection of claims 4-5 and 7 are further insufficient to reach the claims.

It has been held by the courts that to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. See *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). However, as illustrated above, Draper is insufficient to overcome the admitted deficiencies of Yavnai relative to claim 1. Therefore, even presuming that some motivation existed for one of ordinary skill in the art to combine the teachings of Yavnai and Draper, claim 1 is patentably distinguished over the combined teachings of the applied references.

Claims 2-7 each depend, either directly or indirectly, from independent claim 1. These dependent claims are each separately patentable, but are submitted as patentable for at least the same reasons as their underlying independent base claims, and for the additional reasons illustrated above. Therefore, Applicant respectfully submits that the rejection is poorly taken, and kindly requests favorable reconsideration and withdrawal.

Turning to claim 8, the text of the Office Action is insufficient to create a *prima facie* rejection. Claim 8 recites a method of tracking an autonomous UAV during the performance of a pre-programmed active mission, comprising the steps of simulating the performance of the active mission programmed into the UAV in a current simulation of the environment the UAV is operating in, and estimating the present position of the UAV based upon the results of the simulation.

The Office Action purports to address the features of claim 8 (p. 5), but nowhere cites to portions of the references alleging to teach the features of claim 8. "The [Office] cannot rely on conclusory statements when dealing with particular combinations

of prior art and specific claims, but must set forth the rationale on which it relies.” *In re Lee*, 277 F.3d 1338, 61 USPQ2d 1430 (Fed. Cir. 2002). Moreover, claim 8 recites tracking a UAV in the performance of a pre-programmed active mission. For the reasons set forth above, neither Yavnai nor Draper, taken alone or in any combination, teaches or suggests active missions as claimed. Therefore, Applicant respectfully submit that the rejection of claim 8 is poorly taken, and kindly request favorable reconsideration and withdrawal.

In the interest of brevity, Applicant has addressed only so much of the rejection as is considered sufficient to demonstrate the patentability of the claims. Applicant's failure to address any part of the rejection should not be construed as acquiescence in the propriety of such portions not addressed, including, but not limited to, the existence of facts alleged to be established by Applicant admission. Applicant maintains that the claims are patentable for reasons other than these specifically discussed, *supra*.

In light of the foregoing, Applicant respectfully submits that the claims recite patentable subject matter, and kindly solicits an early and favorable indication of allowability of all claims. If the Examiner has any reservation in allowing the claims, and believes that a telephone interview would advance prosecution, he is kindly requested to telephone the undersigned at his earliest convenience.

Respectfully submitted,



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